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United States Department of Agriculture.

DIVISION OF ENTOMOLOGY.

THE CLOVER MITE.

(*Bryobia pratensis* Garman.)

CHARACTERISTICS AND METHOD OF WORK.

The subject of this circular is a reddish-brown mite about twice the size of the ordinary red mite affecting greenhouse plants. It is nearly three-tenths of an inch in length, oval, and with remarkably long anterior legs. Other structural features, together with the peculiar hairs which clothe different parts of the body, are illustrated in the accompanying figure, which represents, much enlarged, the full-grown mite, viewed from above and from below.

This mite first came into special prominence as a disagreeable invader of dwelling houses about ten years since, but it had been known for a number of years earlier as an enemy of various fruit and shade trees and forage plants, its occurrence on clover, particularly in the Middle States, being indicated in its scientific name, *pratensis*, and its common name of clover mite. It belongs to the family of vegetable-feeding mites, Tetranychidæ, which includes such well-known depredators as the red spider of greenhouses, already referred to, and the six-spotted mite, which is quite troublesome to oranges in Florida. In California, where this plant mite is especially mischievous, it has been very generally confounded with the red spider, and in probably most of the references to injury to deciduous trees on the Pacific Coast by the "red spider" the real culprit is the insect under discussion.

The presence of this mite on foliage, either of clover or trees, causes the leaves to yellow or assume a sickly appearance, as if attacked by fungus. On the tender leaves of clover, notably on the upper sides, the juices are extracted, often over irregular, winding areas, imitating in appearance the burrows of certain leaf-mining larvæ. The most notable indication, however, of the presence of the mite is the occurrence of the eggs massed often in such numbers as to completely cover the bark at the crotches and branches and sometimes over the entire surface of the trunk. These eggs are of rather large size and of a reddish color and

are conspicuous objects, and when numerous the decided color they impart to the bark leads to their ready discovery.

As out-of-doors enemies they are injurious at times to clover and other grasses, including the true grasses, as blue stem, but it is to fruit trees that their injuries are especially marked. Throughout the Pacific

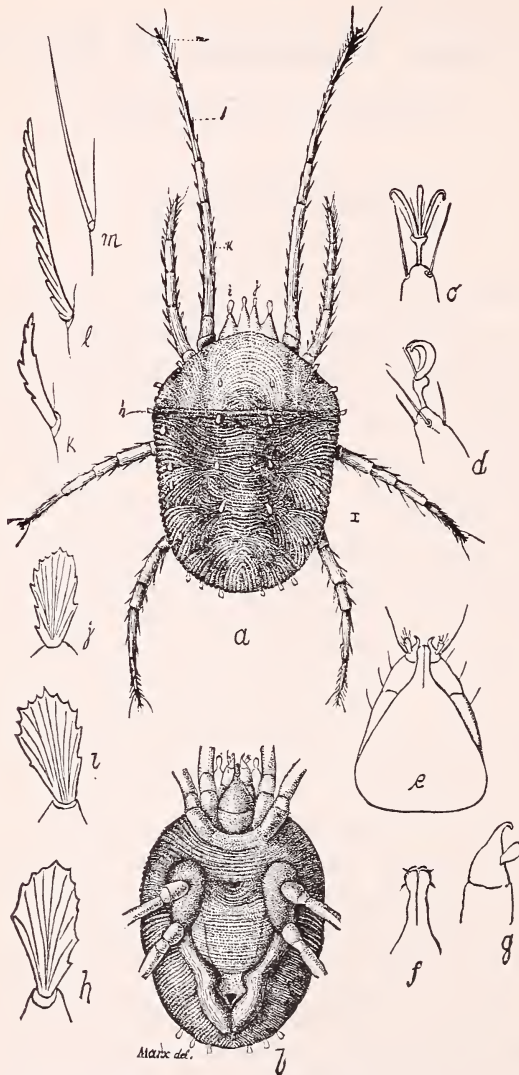


FIG. 1.—*Bryobia pratensis*: a, dorsal; b, ventral view; c and d, claw; e, f, g, mouth-parts; h, i, j, body scales; k, l, m, leg spines (from Insect Life).

Coast and in the fruit districts of Colorado and other Western mountain States the clover mite is one of the principal enemies of such deciduous fruits as peach, prune, plum, apple, pear, almond, cherry, etc., and the poplar and elm, black locust, arbor vitæ, etc., among shade trees. As

house pests they are troublesome from their presence merely in their efforts in the fall to find safe hibernating quarters and occasionally in their spring migrations in search of suitable breeding grounds.

ORIGIN AND DISTRIBUTION.

Attention was first drawn to this mite in 1879 at Washington, D. C., from its occurrence on the trees in the Department grounds and also on clover on lawns. It has since been reported from numerous localities from Massachusetts to California. Northward it occurs in the east in northern New York and Canada. East of the Mississippi it has not been reported in the southern tier of States, the southernmost records occurring in Tennessee and North Carolina.

On the Pacific Coast it is known from San Diego, in California, to East Sound, in Washington; and at Las Cruces, N. Mex., it is a serious fruit pest. In the Sierra Nevada Mountains in California and in the Rocky Mountains in Montana it has been found at elevations of from 7,000 to 8,000 feet.

It is remarkable, therefore, for its ability to exist under marked differences of temperature and elevation. Its wide distribution and its occurrence in situations remote from settlement indicate that it is a native species. It was first characterized scientifically by H. Garman in 1885, who proposed for it the common and Latin name by which it is now known.

HABITS AND LIFE HISTORY.

The wide range of this insect and the different climatic conditions under which it exists lead, as might be expected, to certain variations in its life history and habits in different localities. In the more northern regions of its occurrence and in the higher elevations it winters in the egg state, the last brood, if it may be so called, maturing in the fall, and depositing eggs on branches and trunks of trees sometimes in sufficient numbers to entirely cover the bark two or three layers deep. In 1889 we received a mass of these eggs several layers deep on a piece of bark which the sender states was from an area of at least 50 square feet of eggs on the south side of trunks of cottonwoods growing at an elevation of from 6,000 to 8,000 feet. This was in the Sierra Nevada Mountains, Tuolumne County, Cal., and we have had a similar account, with specimens, from McCarthy Mountain, in Montana, at about the same elevation. In the Middle and Eastern States, where the eggs are frequently found on fruit trees, they are usually confined to the crotches and branches and are not nearly so abundant.

In the colder regions, where the winter is passed in the egg state, the issuance of the young mites the following spring varies from May until the middle of June, depending on the character of the season. In the warmer regions—as, for instance, in the latitude of Washington—the mites begin to be noticeable on foliage and grass in May or earlier, and enter their hibernating quarters early in October, in crevices of fences

or walls or under the loose bark of various trees. It is seen, therefore, that in the warmer localities breeding is hardly interrupted during the winter months and the winter is passed quite as much in the active as in the egg state. Throughout the summer young are produced continuously, as with most other plant mites, with no particular differentiation of broods.

The habit of this mite of abandoning its feeding situations in the fall to seek hibernating quarters elsewhere leads to its being a house pest of no mean importance. This is particularly true wherever it has been breeding on clover or other grasses near dwellings. From such situations, particularly in the Mississippi Valley States, it often swarms into dwellings through doors or windows, its small size enabling it to penetrate wire screens with ease to the very considerable disquietude of the housekeeper. There are only a few records of their entering houses in the East, and in the extreme West they seem only to have been found on trees.

REMEDIES AND PREVENTIVES.

The protection of fruit trees from the attacks of this mite is comparatively easy where the winter is chiefly passed in the egg state, as in Colorado or other elevated or cold districts. The experience of Mr. C. P. Gillette in Colorado has shown that the eggs may be very easily destroyed during winter by applying kerosene emulsion to the trees at about twice the ordinary strength, viz, diluted with five parts of water. Spraying at this time is both economical and easy, on account of the absence of foliage, and no danger will result to the plants from the application. Such an application also in the warmer latitudes will be of almost equal value as a protection to fruit trees, since it will reach what eggs there may be and also many of the mites secreted in the cracks of the bark.

It is a much more difficult matter to protect clover and other grasses from the mites, except as it may be possible to spray in winter the trees, fences, etc., on or in which the mites may be hibernating, in the vicinity of lawns.

Their entrance into houses in fall may be prevented by spraying the lower portion of the building, walls, etc., with pure kerosene as often as need be and also spraying the lawns immediately about the building with kerosene emulsion nine times diluted. The mites may be destroyed after they have gained entrance to the house by the free use of buhach or pyrethrum powder, burning brimstone, or spraying with benzine, taking due precautions with the latter substance in the matter of fire.

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